The Human Palate

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by
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The Form and Orientation of the Palate, with special reference to Chatham Island (Moriori) and Maori skulls.
(With 41 Plates)
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(i)

AUTHOR’S NOTE
The non-metrical part of this work is to be published elsewhere.
While this supplement was being printed, the author received confirmation that a further portion of the work (including eight plates containing seventy-three figures, mostly half-tone photographs) will appear in the Journal of the Polynesian Society as follows:
“The Human Palate and Dentition” Non-metrical studies in Moriori and Maori skulls.
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Author’s Explanatory Note
Practical work for this study commenced in 1927. In 1933 a thesis was presented in partial fulfilment for the degree of D.D.S. (N.Z.). Much of the material for that thesis was then discarded, additional data gathered and new text and illustrations prepared. Publication was prevented first by the economic depression and its after effects, and then similarly by the war, but from time to time new work was incorporated and revisions and improvements made. One of these was the Piltdown paper which was read at the Auckland Congress of the Australian and New Zealand Association for the Advancement of Science in 1937. It was written after a study of plaster casts alone, and set out to prove that the Piltdown canine was an upper left tooth, not lower right, and further, that no such creature could have existed as that portrayed by the Smith-Woodward restoration from the Piltdown fragments. Now that modern techniques applied to the actual fragments have proved the fraud of their origin, there is no point in retaining the text of my paper. While that has been deleted it has not been
feasible to omit all graphic reference to Piltdown. Certain graphs and tracings in which it was included had to be retained.

Apart from describing a new method, and comparing this with other methods, the work was planned for the fullest possible study of the palate in the skulls available. This envisaged examination of form from various aspects, studies of size, of symmetry and of orientation, and included the dentition. Measurement of the palate became a study of bone, with teeth and dental arches represented by their position in the alveolar bone that supports them, and largely determines palate form and limits.

It was found impracticable to measure teeth and dental arches themselves, but they presented many features worthy of note both for a purely dental study and for their relation to features of the palate itself. All these, whether normal variations, or abnormal and pathological conditions of teeth and bone (including abscess cavities, excessive wear and dislocation of teeth,) comprise the non-metrical part of the work. The complete work, with its variety of diagrams, graphs, plotted contours and photographs, has had to be divided for purposes of publication. The many line illustrations essential to this report of metrical work, and the cost of publication without assisting grants, has made it necessary to confine photographs of specimens to the sections on non-metrical studies which it is hoped soon to publish elsewhere. The work has therefore suffered deletion of cross references between the sections.

The whole of the work has been done by the author, including collection of data, statistical analysis, line drawings and graphs. Facilities to work were granted by the Anatomy Department of Otago University and by various museums, etc., and are gratefully acknowledged elsewhere. No financial assistance of any kind was received, and much of the work was done in holiday time and in periods of special leave without pay.


Introduction and Historical Note

In recent years physical anthropologists have been studying the facial regions of the skull as well as the cranium, and dental science is focusing attention from new aspects on the importance of the masticatory apparatus. Inefficient mastication often follows dental disease or deformity of the jaws, and may have far reaching effects on physical development. Facial deformities may arise in this way, while in other cases the jaws may be deformed together with other parts of the face by a common cause or set of conditions. As growth of the jaws is important during growth of the face in general, it is desirable to ascertain the normal form of the jaws and their orientation in the skull. The present study has these objectives as well as others in view.

Facial deformities are common in New Zealand and in some other civilised communities. It is known that the native races in these countries were comparatively immune from such defects when they lived under their natural conditions. Where civilised conditions have been adopted similar facial deformities have appeared among the natives. Therefore, studies of those natives under their primitive conditions might well indicate not only the normal’ development, but also some of the factors responsible for the changes that may accompany civilisation. Such a study reveals some features that are characteristic for that particular race or group and are of value to the anthropologist for the study of racial relationships. A familiar example is the protruding jaws of negroid races. If our knowledge is to help us improve some individuals and
promote the natural development of others, we must be able to distinguish between inherited racial characteristics and those that arise from differences in environment or living conditions. Already we have much knowledge of some rather primitive peoples and physical anthropologists have made valuable contributions through studying skeletal material. Recent students of jaws and teeth include Campbell (4) and Shaw (26) who worked on the Australian Aboriginal and the Bantu races of South Africa respectively. When the present study was begun only Campbell’s work was published, and it was felt that knowledge of material racially distinct from his would furnish useful matter for comparison.

The original intention was in fact to adhere closely to Campbell’s method of attacking the problem, but as the work progressed it became increasingly evident that with the material available his method was in many ways unsatisfactory. The modifications found necessary and the reasons for their adoption will be discussed later.

The Chatham Islands are situated some 400-500 miles east of Lyttelton (N.Z.). For the data here given regarding their original inhabitants – usually known as Morioris – I am largely indebted to Dr. H. D. Skinner who has visited the Islands, and collected much information in two memoirs (27 & 28) and also the late Mr. T. W. Downes (8) who reviewed certain traditions and hypotheses. It seems probable that like the Maoris of New Zealand, the Morioris were of a mixed Polynesian and Melanesian stock. According to their own traditions they inhabited the Islands for some twenty-seven or twenty-eight generations, but where they came from and whether they found another race already there is uncertain. (See Map on Plate 1.)

The first European contact with them dates from 1791 when the Islands were named by Lieut. Broughton of H.M. Brig Chatham who landed at Kaingaroa Bay. The population was then estimated at 1600. Whalers and sealers began to visit the Islands about 1828 but left no written records.

From Broughton’s description supplemented by those of Diffenbach (7), Shand (25), Percy Smith (29), Baucke (28) and others we gather that the Morioris were on the whole a well-built and sturdy race slightly shorter and broader than the Maoris. They were apparently gentle and timid and lacked the energy, intelligence and warlike characters exhibited by the latter who invaded the Islands and conquered them in 1835. From that time their numbers steadily declined and the last pure-blooded member of the race Tame Horomona Te Rangitapu (Thomas Solomon), died in March 1933. The present population of some 400-500 consists of Europeans, Maoris and half-castes.

Various authorities tell us that the food of the Morioris consisted of fern root and the kernel of the karaka nut, together with birds, fish in shell and scale, seals and occasionally stranded whales. The condition of the food, often sand soiled – but the grit was apparently unminded – wore down their otherwise sound teeth before middle age was reached. Baucke states that he examined hundreds of skulls solely to discover carious teeth but found only one and that affected slightly.

Percy Smith (29) remarks that the Morioris led a hard, strenuous life.